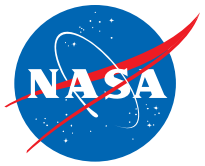


National Aeronautics and Space Administration

www.nasa.gov

# NASA Summer 2014


Hannelle Fares

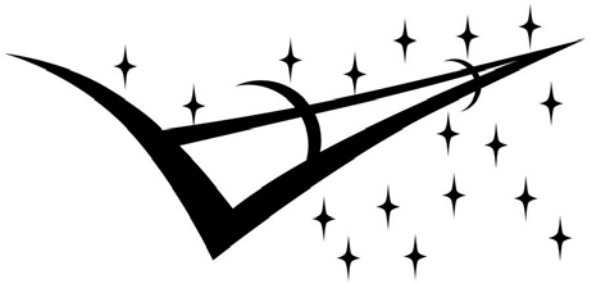
Rice University

David Ham, Ali Keenan,

Shannon Melton

A-TEAM

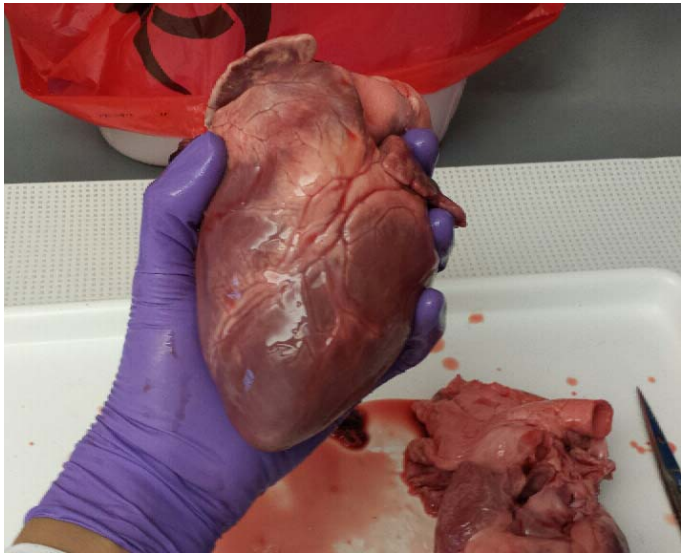

SPACE LIFE SCIENCES
SUMMER INSTITUTE

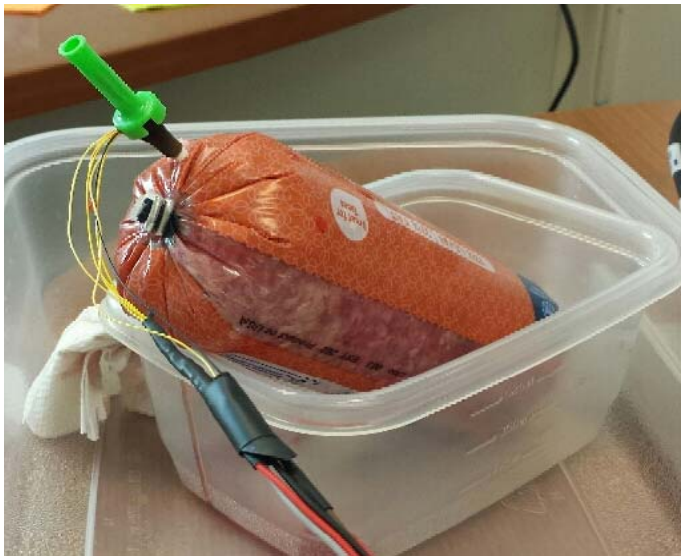


wyle

# Past experiences

- Computer repair technician
- Rice University Class 2015
  - Bioengineering
- Research & work
  - Tissue Culture –
    - Hypoxia & CAVD in PAVICs
  - Medical Device –
    - Bioimpedence fluid accumulation catheter
  - Teaching Assistant –
    - Matlab / Numerical Methods



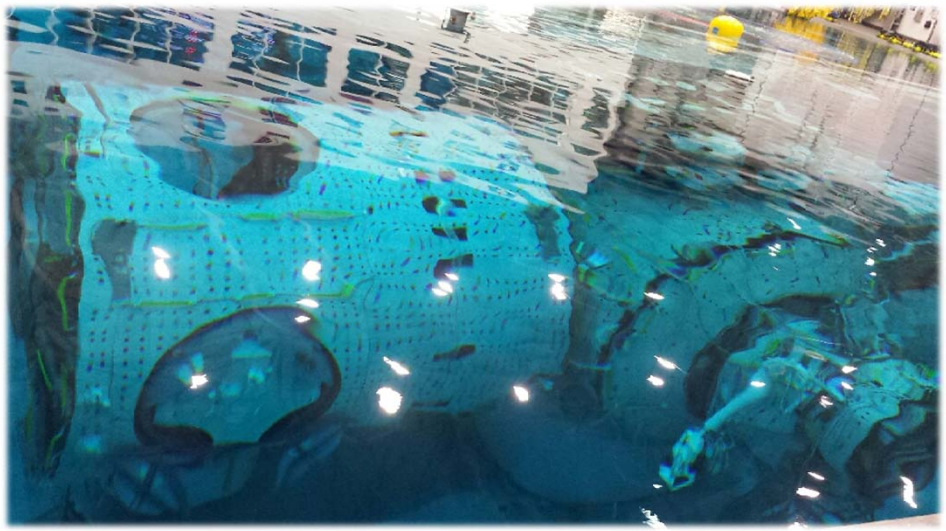


# Internship Objective

Create a motion validation system using Google Glass and Microsoft Kinect to provide instantaneous feedback for integration with NASA tutorials and procedures.

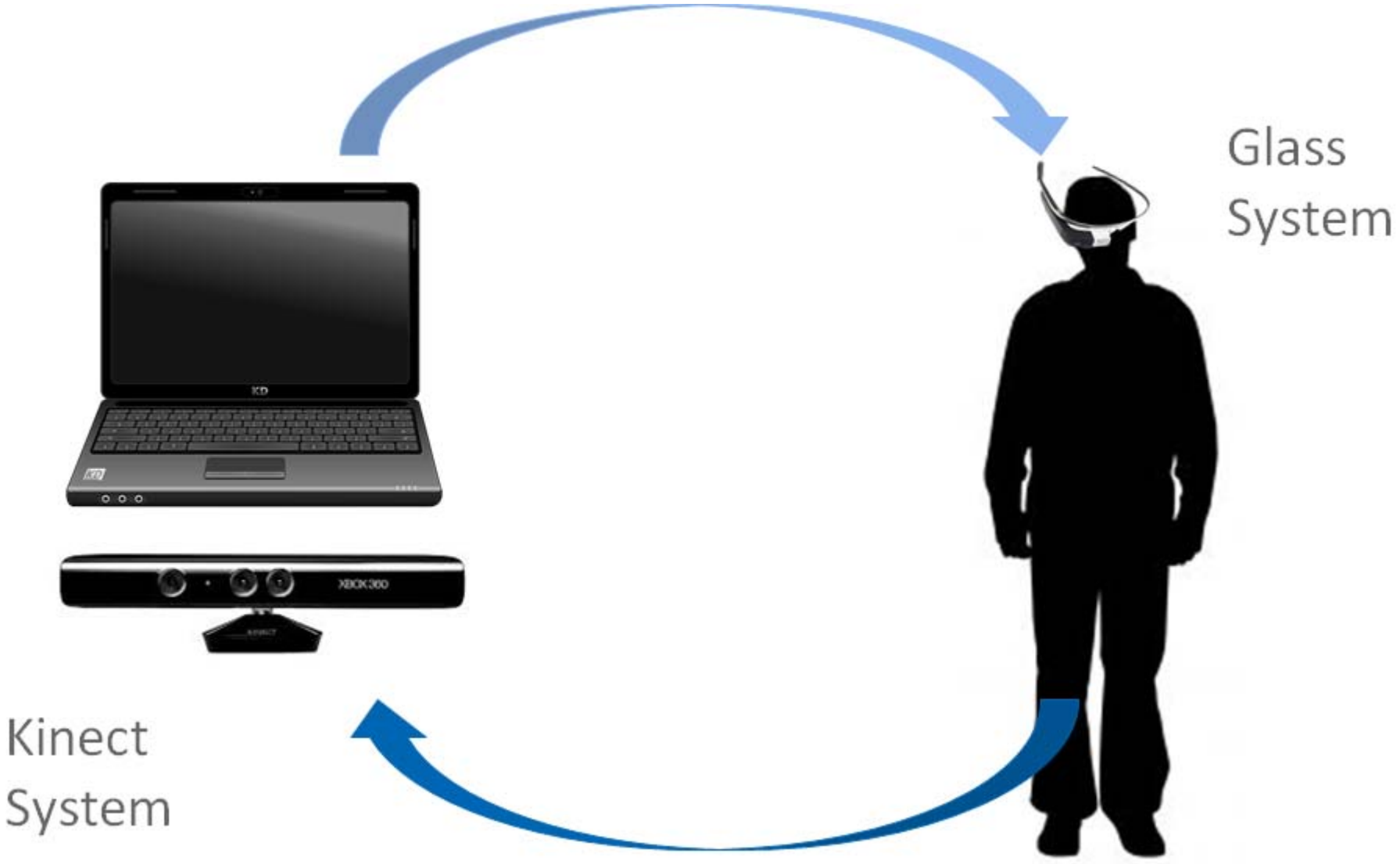
# Potential Impact

- NASA investment in simulations
  - Card-board mockups to NBL



- Many applications
  - Medical examinations
  - ISS surface sampling
  - Any large motion procedure

# Motion Validation System

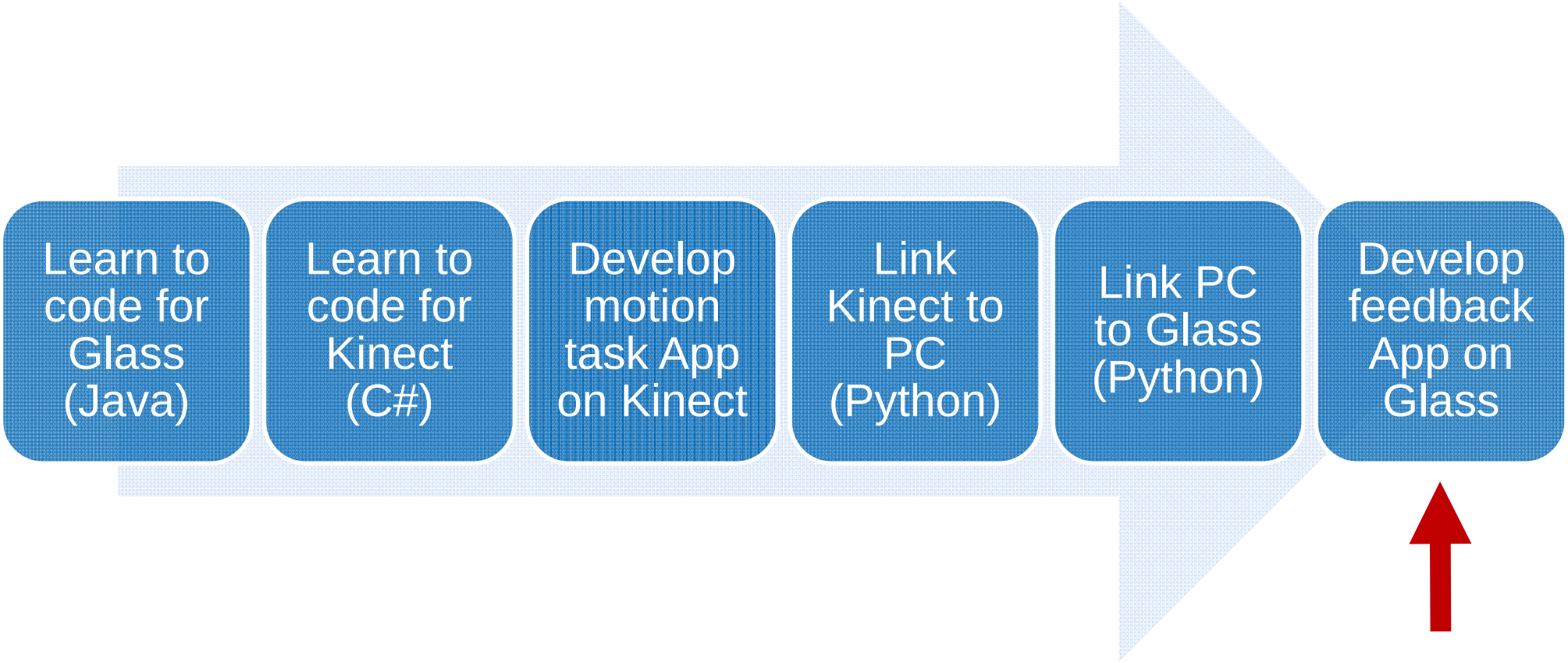


# Development Process

- Networking
  - Colabs, Shelby Thompson
- Learning to code
  - Java, C#, Python
- Learning the hardware
  - Capabilities and potential

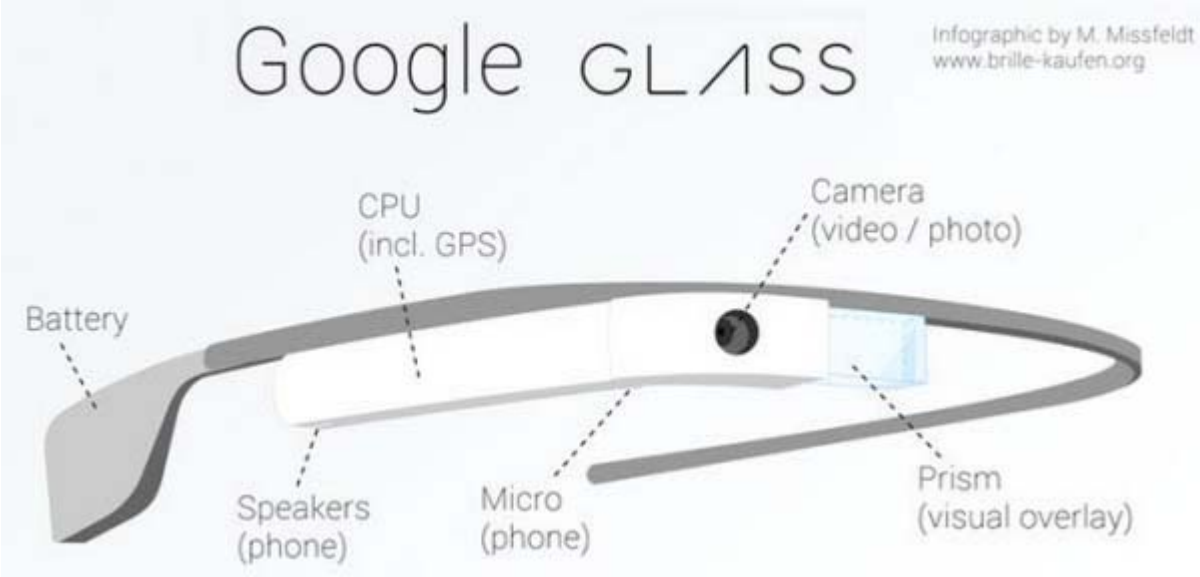
**Iterative Trial & Error**

# Project Milestones



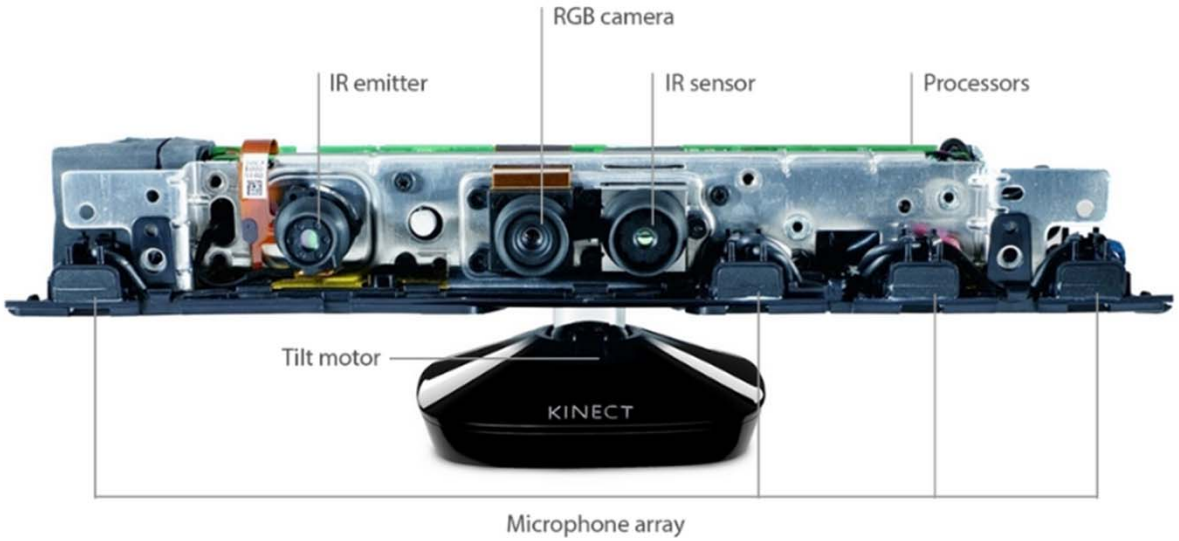
# Google Glass

- Wearable technology with a head mounted optical display
- Released February 2013
- Android Apps primarily in Java



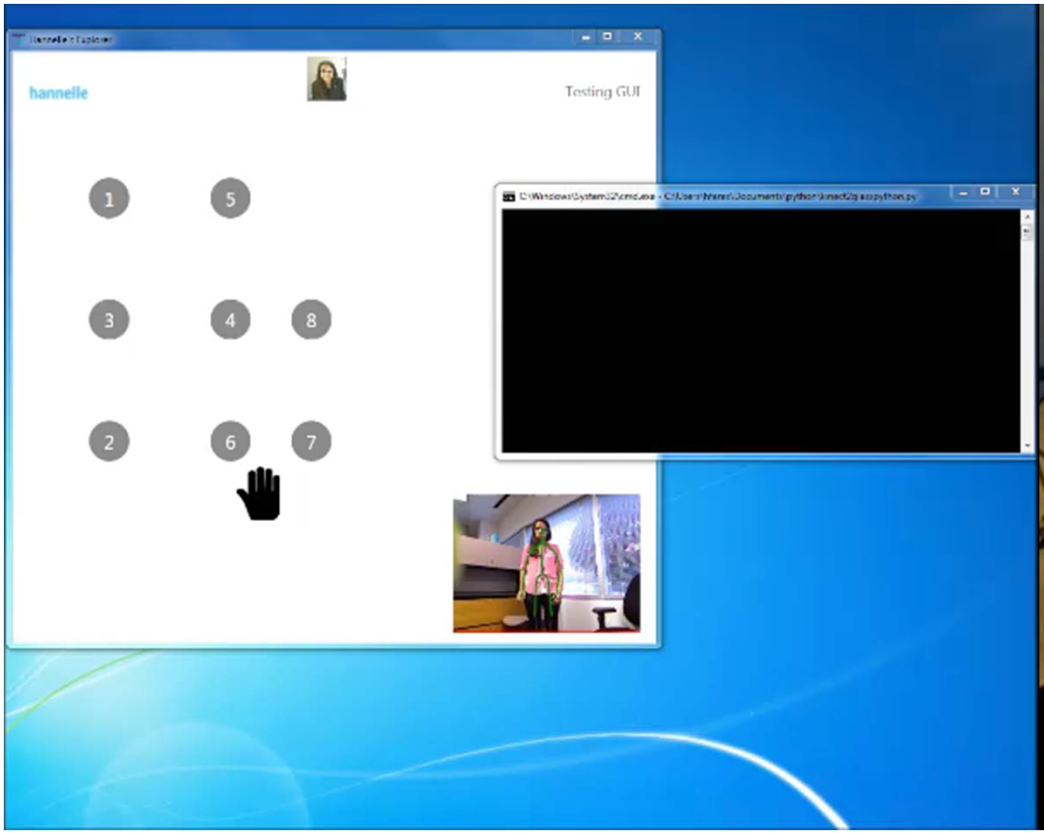
# Microsoft Kinect v1

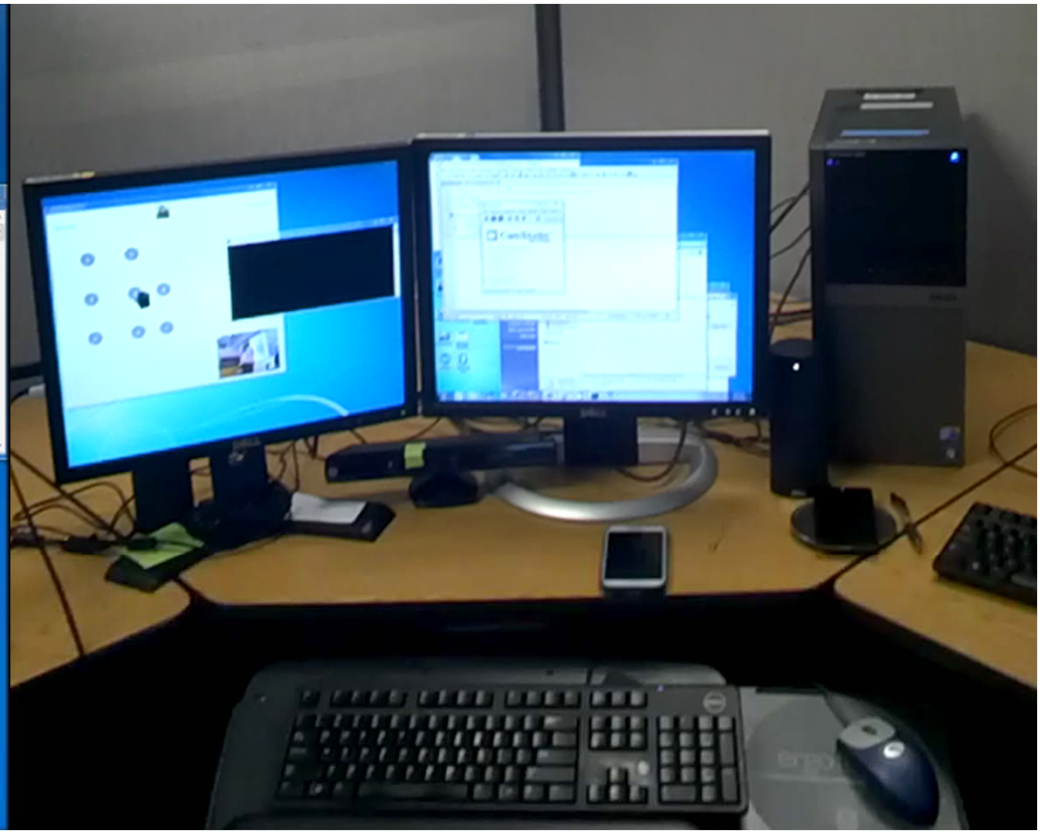
- Motion sensing input device
- Released Nov. 4th 2010 for use with the Xbox 360 only
- Hacked 6 days later
- Microsoft Apps in C#/C++/Visual Basic




www.aud.ucla.edu

# Kinect to PC



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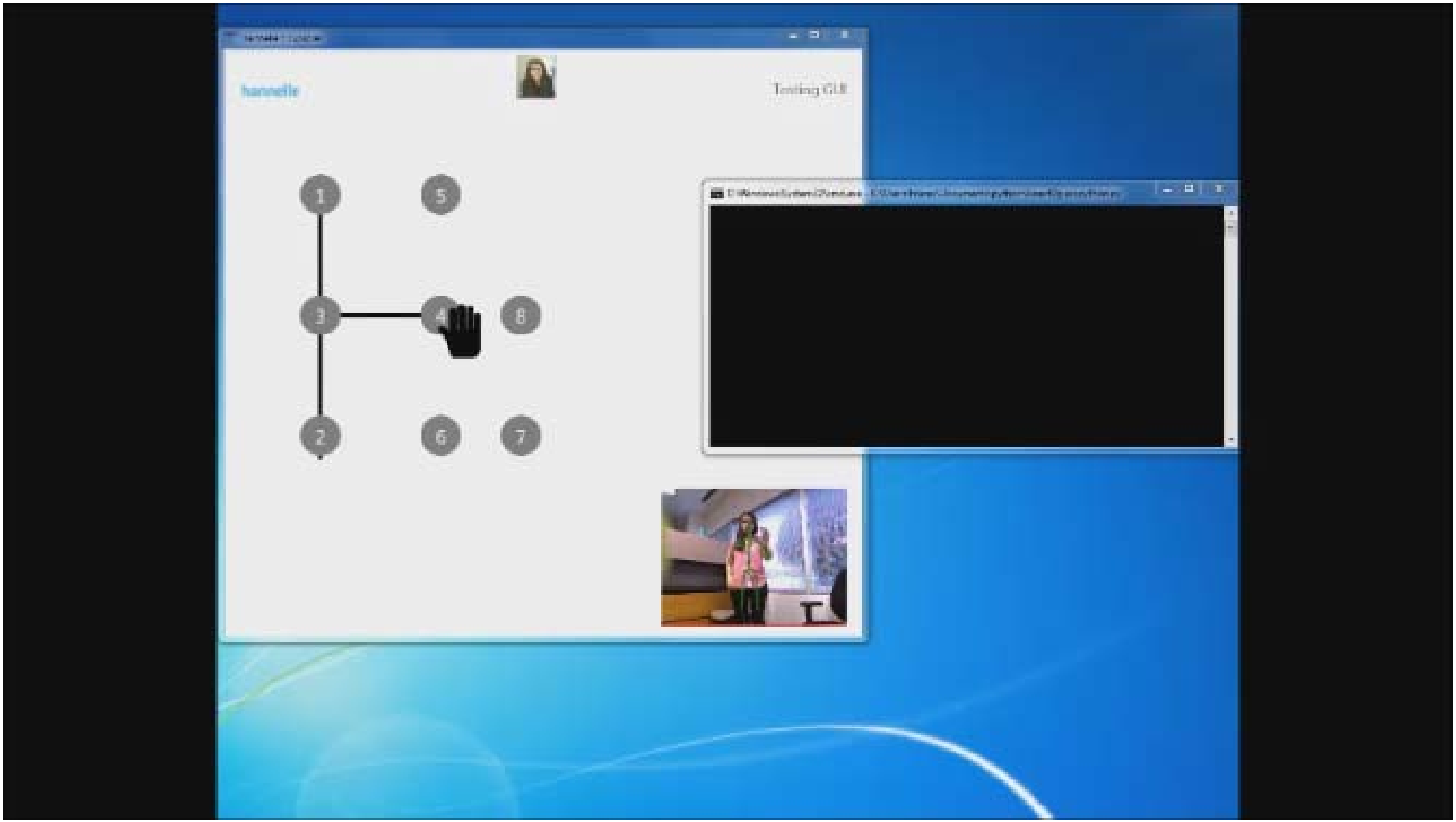
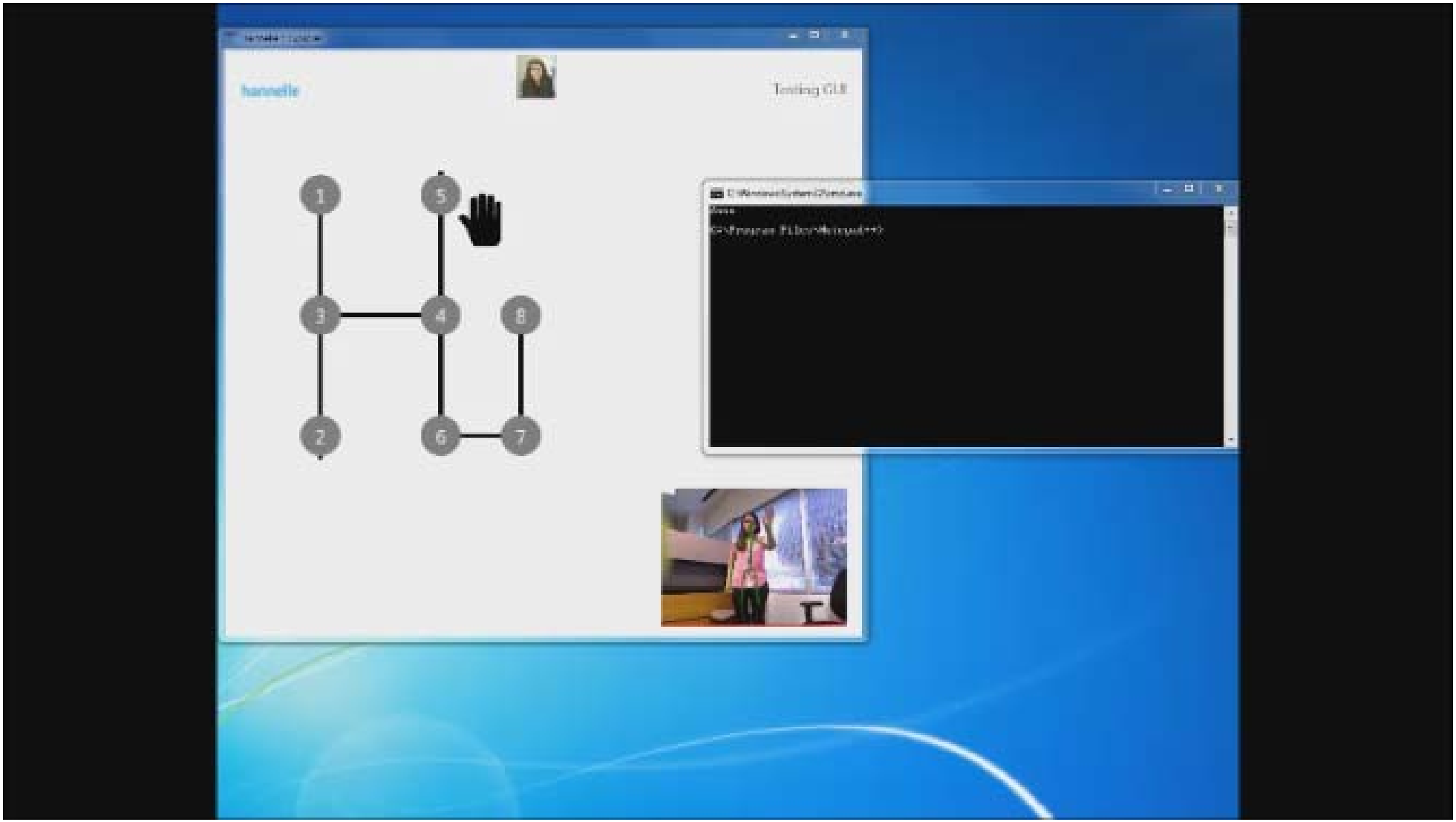


# Kinect to PC

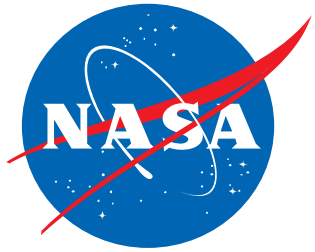


# PC to Glass – *In Progress*

| Present | Goal |
|---|---|
| Trigger app from Python | Trigger app from Python |
| Wired connection | Bluetooth/WiFi connectivity |
| Test card (“Success”) | Feedback card (“Failure”) |
| Ends after test card | Display next step |

# Discussion

- Learned basics of
  - Java/C#/Python
  - Hardware integration
- Beginning steps for improved procedures
  - Safety, efficiency, ease of instruction
- Future work
  - Further research into Google Glass and motion analysis
    - Glass on the ISS?


NASA